

AMENDMENT TO THE CLAIMS

1. (canceled)
2. (currently amended) A robotic tube handler system comprising:
 - a robotic tube handler having:
 - a housing with a perimeter rectangular frame having sides;
 - a bed in the perimeter frame for ~~orthogonal~~ orthogonal placement of tube racks, the bed having a seating structure in which ~~standard~~ tube racks of identical size seat in a predefined array;
 - a tube pick-up mechanism having:
 - a crossbar transport unit with tracks on two opposite sides of the frame;
 - a cross beam with two post supports wherein the cross beam spans ~~spanning~~ the bed ~~wherein and~~ the two post supports engage the tracks;
 - a transport assembly with a motor and a drive assembly ~~in engagement with each of the post supports with~~ ~~for~~ fore and aft transport of the crossbar transport unit on operation of the motor;
 - an elevator carriage supported on the cross beam with a transport mechanism having a motor and a drive assembly in engagement with the cross beam with ~~for~~ side to side transport of the elevator carriage on the cross beam on operation of the motor;
 - an elevator assembly;
 - a pick head unit wherein the elevator assembly has a transport mechanism with a motor that vertically displaces the pick head unit on

operation of the motor, the pick head unit having an actuatable pick head; and,
a controller with a control unit having electronics
operationally connected to the drive motors for precision control of X, Y, Z motion
of the pick head unit and actuation of the pick head for select engagement and
precision transport of tubes in tube racks seated in the bed.

3. **(currently amended)** The robotic tube handler system of claim 2 wherein the housing has a platform with a parking holder for placement of a limited number of tubes, typically when during sorting operations.
4. **(currently amended)** The robotic tube handler system of claim 2 wherein the housing has a platform with a shuttle holder for placement of a limited number of tubes, typically wherein the shuttle holder has a transport mechanism that displaces the shuttle holder when transferring tubes to another adjacent robotic tube handler.
5. **(currently amended)** The robotic tube handler system of claim 2 in combination with tubes having a bottom with an identification element wherein the housing has a platform with an identification station that verifies the identity of a discrete tube, wherein the identification station is located on the platform at a location accessible by the pick head unit and the identification station has an upwardly directed sensor that senses the identification element of a tube positioned over the sensor by the pick head.
6. **(previously presented)** The robotic tube handler system of claim 5 wherein the identification station has a barcode reader.

7. (previously presented) The robotic tube handler system of claim 5 wherein the identification station has a RFID reader.

8. (currently amended) The robotic tube handler system of claim 2 including a tube fill unit wherein the pick head unit on the transport mechanism of the elevator assembly ~~is replaceable with a~~ and the tube fill unit are exchangeable.

9. (currently amended) The robotic tube handler system of claim 2 wherein the pick head of the pick head unit has ~~a pick head for selectively picking a single tube from a tube rack, the pick head having four rigid~~ pick fingers that spread when actuated, the pick fingers being configured to selectively and releasably engage a single tube in a rack.

10. (previously presented) The robotic tube handler system of claim 2 wherein the system includes racks that have a marking on the rack and the tube handler has a marking reader that reads the marking on the rack and identifies the rack.

11. (canceled)

12. (currently amended) The robotic tube handler system of claim ~~11~~ 9 wherein the four pick fingers are slender and configured to drop into the four spaces of closely spaced matrix arranged tubes.

13. (canceled)

14. (canceled)

15. (canceled)

16. (currently amended) The robotic tube handler system of claim ~~15~~ 12 wherein the pick head unit includes an actuator engaging the pick fingers.

17. (previously presented) The robotic tube handler system of claim 16 wherein the actuator has a cam device to spread and close the fingers.

18. (previously presented) The robotic tube handler system of claim 17 wherein the cam device is spring biased to close the fingers and, by a solenoid, actuated to open the fingers.